What is claimed is:

1   1.   A method of providing a spatially filtered version of an image by selectively modifying

2   image pixel amplitudes as a predetermined function of spatial frequency components of the

3   image pixels, comprising:

4   dividing an overall frequency range of the image into a plurality of constituent frequency

5   ranges;

6   providing, for each of the constituent frequency ranges, a spatial filter that receives the

7   image pixels and produces a filtered output representative of the spatial frequency components of

8   the pixels that are within that constituent frequency range;

9   scaling each of the filtered outputs by a scaling factor specific to the associated spatial

10   filter, so as to produce a scaled output; and,

11   combining the scaled outputs to produce a composite output representative of the

12   spatially filtered version of the image.

2.   A method according to claim 1, wherein the constituent frequency ranges are defined by

octaves, such that each constituent frequency range is one half as wide as the next larger

constituent frequency range.

1   3.   A method according to claim 1, wherein the constituent frequency ranges are substantially

2   contiguous.

1   4.   A method according to claim 1, wherein the constituent frequency ranges overlap one

2   another.

1   5.   A method according to claim 1, wherein each of the scaling factors is a function of time.

15

1   6.   A method according to claim 5, wherein the scaling factors vary as a function of time so

2   as to sweep a pass-band having a predetermined bandwidth across the overall frequency range,

3   such that image components characterized by frequencies within the pass-band are enhanced or

4   passed without substantial attenuation.

1   7.   A method according to claim 6, wherein image components characterized by frequencies

2   outside of the pass-band are substantially suppressed.

1   8.   A method according to claim 6, wherein image components characterized by frequencies

2   outside of the pass-band are attenuated but not substantially suppressed.

1   9.   A method according to claim 6, wherein the predetermined bandwidth varies as a

2   function of time.

1   10.   A method according to claim 5, wherein the scaling factors vary as a function of time so

2   as to sweep two or more pass-bands, each having a predetermined bandwidth, across the overall

3   frequency range, such that image components characterized by frequencies within each of the

4   pass-bands are enhanced, or are passed without substantial attenuation.

1   11.   A method according to claim 10, wherein image components characterized by frequencies

2   outside of the pass-band are substantially suppressed.

1   12.   A method according to claim 10, wherein image components characterized by frequencies

2   outside of the pass-band are attenuated but not substantially suppressed.

1   13.   A method according to claim 10, wherein the predetermined bandwidth varies as a

2   function of time.

16

1   14.   A method according to claim 1, wherein the spatial filter produces a filtered output as a
2   predetermined function of a neighborhood of pixels.

1   15.   A system for providing a spatially filtered version of an image by selectively modifying
2   image pixel amplitudes as a predetermined function of spatial frequency components of the
3   image pixels, comprising:
4   a frequency divider for dividing an overall frequency range of the image into a plurality of
5   constituent frequency ranges;
6   for each of the constituent frequency ranges, (i) a spatial filter that receives the image
7   pixels and produces a filtered output representative of the spatial frequency components of the
8   pixels that are within that constituent frequency range, and (ii) a multiplier that scales each of the
9   filtered outputs by a scaling factor specific to the associated spatial filter, so as to produce a
10   scaled output; and,
11   a combiner for combining the scaled outputs to produce a composite output representative
12   of the spatially filtered version of the image.

16.   A system according to claim 15, wherein the constituent frequency ranges are defined by
2   octaves, such that each constituent frequency range is one half as wide as the next larger
3   constituent frequency range.

1   17.   A system according to claim 15, wherein the constituent frequency ranges are
2   substantially contiguous.

1   18.   A system according to claim 15, wherein the constituent frequency ranges overlap one
2   another.

1   19.   A system according to claim 15, wherein each of the scaling factors is a function of time.

17

1 20. A system according to claim 19, wherein the scaling factors vary as a function of time so

2 as to sweep a passband having a predetermined bandwidth across the overall frequency range,

3 such that image components characterized by frequencies within the passband are enhanced or

4 passed without substantial attenuation.

1 21. A system according to claim 20, wherein image components characterized by frequencies

2 outside of the passband are substantially suppressed.

1 22. A system according to claim 20, wherein image components characterized by frequencies

2 outside of the passband are attenuated but not substantially suppressed.

1 23. A system according to claim 20, wherein the predetermined bandwidth varies as a

2 function of time.

1 24. A system according to claim 19, wherein the scaling factors vary as a function of time so

2 as to sweep two or more passbands, each having a predetermined bandwidth, across the overall

3 frequency range, such that image components characterized by frequencies within each of the

4 passbands are enhanced or passed without substantial attenuation.

1 25. A system according to claim 24, wherein image components characterized by frequencies

2 outside of the passband are substantially suppressed.

1 26. A system according to claim 24, wherein image components characterized by frequencies

2 outside of the passband are attenuated but not substantially suppressed.

1 27. A system according to claim 24, wherein the predetermined bandwidth varies as a

2 function of time.

18

1   28.   A system according to claim 15, wherein the spatial filter produces a filtered output as a

2   predetermined function of a neighborhood of pixels.

1   29.   A method of a spatially filtering an image, comprising:

2   providing a spatial filter for receiving an array of intensity values corresponding to the

3   image, and for producing a plurality of filtered outputs, each of which represents the intensity

4   values having frequency components within a predetermined frequency range;

5   scaling each of the filtered outputs by an associated scaling factor, so as to produce a

6   plurality of scaled outputs; and,

7   combining the scaled outputs to produce a composite output representative of a spatially

8   filtered version of the image.

30.   A method according to claim 29, wherein each of the scaling factors is a function of time.

31.   A method according to claim 30, wherein the scaling factors vary as a function of time so

as to sweep a passband having a predetermined bandwidth across the overall frequency range,

such that image components characterized by frequencies within the passband are enhanced, or

passed without substantial attenuation.

32.   A method according to claim 31, wherein image components characterized by frequencies

2   outside of the passband are substantially suppressed.

1   33.   A method according to claim 31, wherein image components characterized by frequencies

2   outside of the passband are attenuated, but not substantially suppressed.

1   34.   A method according to claim 31, wherein the predetermined bandwidth varies as a

2   function of time.

19

1 35.   A method according to claim 30, wherein the scaling factors vary as a function of time so

2 as to sweep two or more passbands, each having a predetermined bandwidth, across the overall

3 frequency range, such that image components characterized by frequencies within each of the

4 passbands are enhanced, or passed without substantial attenuation.

1 36.   A method according to claim 35, wherein image components characterized by frequencies

2 outside of the passband are substantially suppressed.

1 37.   A method according to claim 35, wherein image components characterized by frequencies

2 outside of the passband are attenuated but not substantially suppressed.

1 38.   A method according to claim 35, wherein the predetermined bandwidth varies as a

2 function of time.

1 39.   A system for a spatially filtering an image, comprising:

2   a spatial filter for receiving an array of intensity values corresponding to the image, and

3 for producing a plurality of filtered outputs, each of which represents the intensity values having

4 frequency components within a predetermined frequency range;

5   a plurality of multipliers for scaling each of the filtered outputs by an associated scaling

6 factor, so as to produce a plurality of scaled outputs; and,

7   a combiner for combining the scaled outputs to produce a composite output representative

8 of a spatially filtered version of the image.

20